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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000,429	11/30/2001	Paul M. Dentinger	SD-8348	9193

7590 11/05/2003

Timothy Evans  
MS 9031  
Sandia National Laboratories  
7011 East Avenue  
Livermore, CA 94550

EXAMINER

WALKE, AMANDA C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 11/05/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

10/000,429

Applicant(s)

DENTINGER ET AL.

Examiner

Amanda C Walke

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-16 is/are allowed.
- 6) ☒ Claim(s) 1 and 6-8 is/are rejected.
- 7) ☒ Claim(s) 2-5 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/000,429	DENTINGER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Amanda C Walke	1752	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the application filed 11/30/2001.
2. ☒ The allowed claim(s) is/are 1-16.
3. ☒ The drawings filed on 30 November 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.
  - (b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.
  - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                             | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)          |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____             |
| 5 <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. <u>4</u> | 6 <input type="checkbox"/> Examiner's Amendment/Comment                             |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
|  | 9 <input type="checkbox"/> Other  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kihara et al (5,332,648) in view of Wargo et al (5,426,222).

Kihara et al disclose a photosensitive composition a suitable for use in manufacturing a semiconductor device. The composition comprises a radiation curable/polymerizable resin, a dissolution inhibitor, a solvent, and a photoacid generator. Suitable photoacid generators include known onium salts including iodonium salts, and a preferred resin is a novolak resin. A particularly preferred resin is a novolak/ polyvinylphenol resin (abstract, column 3, lines 17-43, column 5, line 49- column 6, line 45, and column 8, line 30 to column 9, line 45). The photoacid generator should be present in the composition in an amount of 0.001 to 20 % by weight (as required by the instant claim 7; column 11, lines 20-31). The resist is employed in a method which includes the steps of coating the resist onto a substrate, dried/pre-baked at a temperature of 150 ° or less (as required by the instant claim 8), exposed to radiation through a mask, post-baked at 150 ° C or less, then developed (column 11, line 59 to column 12, line 46). The reference further teaches that polymers having phenolic groups in the skeleton will have a softening point of greater than 150 ° C, and thus can withstand baking at temperatures of up to at least 150 ° C (column 13, line 66 to column 14, line 20). While the reference teaches that any

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known onium compound, including iodonium compounds, may be employed in the composition, the reference fails to specifically teach an onium carboxylate salt.

Wargo et al disclose a method of forming iodonium salts suitable for use as acid catalysts in acid-polymerization and in curing systems such as radiation curable coating compositions. In column 6, the reference teaches a salt having the formula  $R^i_a ArI + ArR^{ii}_b X^-$  wherein  $R^i$  maybe a carboxylate group (COOH) or a carboxylic acid substituted group which is claimed by claim 8 (column 6, line 27- column 7, line 52 claims 2 and 8). Therefore, one of ordinary skill in the art would have been motivated to prepare the diaryliodonium compound of the reference wherein the compound contained a carboxylic acid group thus meeting the limitations of the instant claim 1 for the onium carboxylate salt. The reference further teaches that the compound may be used with any radiation curable coating composition.

Given the teaching of Wargo et al of conventional iodonium salts that are advantageously employed as acid catalysts, it would have been obvious to one of ordinary skill in the art to prepare the material of Kihara et al employing the iodonium salt of Wargo et al as the acid generator as it is taught to be conventional and advantageous, with reasonable expectation of achieving a fine resist pattern having a good cross-sectional shape.

With respect to the limitation of the instant claims that the onium carboxylate salt is a dissolution inhibitor, it is the position of the examiner that despite the difference in the purpose of addition of the onium compound between the reference and the instant specification, that when added the compound would function in the same manner when added to the resist composition given its inherent properties. The prima facie case of obviousness is not undermined simply because applicant's motivation for teaching to add the compound to the material differs

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from that of the prior art's motivation. In re Dillon, 919 F.2d 688, 692-93, 16 USPQ2d 1897, 1901 ( Fed. Cir. 1990) ( in banc ), cert. Denied, 500 U.S. 904 (1991).

***Allowable Subject Matter***

3. Claims 2-5 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to teach or suggest to one of ordinary skill in the art to prepare the material of claim 1 wherein the onium carboxylate salt is a cholate or wherein the dissolution rate of the photoresist composition in aqueous base is less than about  $1.3 \times 10^{-4}$   $\mu\text{m}/\text{sec}$ .

4. The following is a statement of reasons for the indication of allowable subject matter: Claims 10-16 are indicated as containing allowable subject matter. The prior art of record fails to teach or suggest to one of ordinary skill in the art to prepare the material of claim 10 wherein the resist comprises an onium cation protected carboxylate polymer.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Crivello et al (5,362,607), Brock et al (2002/0146639), and Cheng et al (2003/0008246) are cited for their teachings of cholate compounds as dissolution inhibitors. Braun et al (5,532,411), Feist et al (5,405,991) is cited for their teachings of the preparation methods of carboxylate salts and iodonium salts.

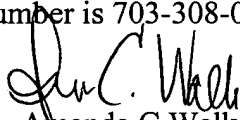
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda C Walke whose telephone number is 703-305-0407.

The examiner can normally be reached on M-R 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached on 703-308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
Amanda C Walke  
Examiner  
Art Unit 1752

ACW  
October 29, 2003

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***Allowable Subject Matter***

1. Claims 1-16 are allowed.
2. The following is an examiner's statement of reasons for allowance: In the application filed 11/30/2001, applicants claims a photoresist composition comprising a phenolic resin and an onium carboxylate salt. The examiner performed a search of the prior art of record for an onium carboxylate compound, however no references teaching such a compound (nor a compound in combination with a photosensitive resin) were found. The examiner did find several references which taught cholate compounds used as dissolution inhibitors in photosensitive compositions in combination with a phenolic resin, and references that taught preparations methods of carboxylate salts utilizing onium salts, but none of the references taught the claimed compounds. Therefore, the present claims 1-16 are now allowable over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Crivello et al (5,362,607), Brock et al (2002/0146639), and Cheng et al (2003/0008246) are cited for their teachings of cholate compounds as dissolution inhibitors. Braun et al (5,532,411), Feist et al (5,405,991), and Wargo et al (5,426,222) are cited for their teachings of the preparation methods of carboxylate salts and iodonium salts.



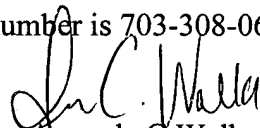
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Amanda C Walke  
Examiner  
Art Unit 1752

ACW  
September 30, 2003